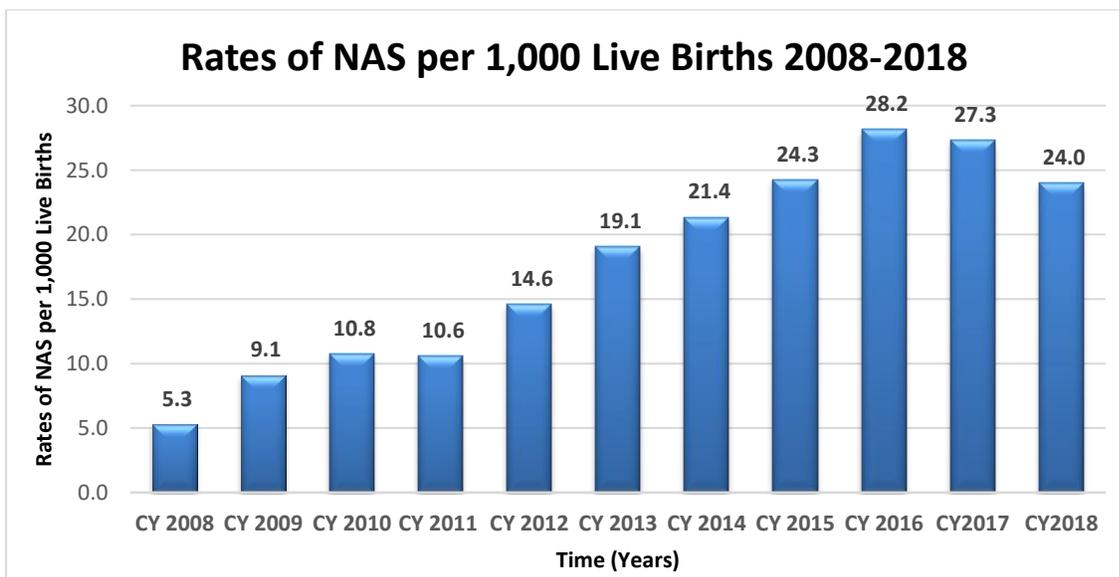


Neonatal Abstinence Syndrome (NAS) among TennCare Enrollees: 2018 data

NAS is a collection of signs and symptoms experienced by infants shortly after birth that can occur when a newborn is prenatally exposed to drugs causing dependence. Many times, the baby is exposed when the mother uses substances such as prescription medications or illicit drugs during pregnancy, and, after the baby is born, he/she goes through withdrawal because he/she is no longer receiving the substances. Over the past decade, there has been a nearly five-fold rise in the incidence of babies born with NAS in Tennessee. Infants with NAS often require longer stays in the hospital, and occasionally, pharmaceutical intervention.

This report documents the occurrence of neonatal abstinence syndrome among TennCare enrollees in 2018. Cases of neonatal abstinence syndrome were identified based on the presence of ICD10 diagnosis codes P96.1¹ and P96.2¹ transmitted to TennCare from medical providers billing for services provided to infants during the first year of life. For 2018, infants born between January 1 and December 31, 2018, were included in the report. Where other years are provided for comparison purposes, the cohorts were born during the specified calendar year. TennCare eligibility status was determined using TennCare’s Interchange system. Cases were identified from infants that were eligible at time of birth or enrolled in TennCare during their first year of life. Live births, used as the denominator, were determined based on a linkage of vital statistics records and TennCare Interchange records.

Figure 1: Incidence of Neonatal Abstinence Syndrome among TennCare Enrollees



As Figure 1 illustrates, there was an increase in the incidence rates of NAS per 1,000 live births among TennCare recipients from CY2008 to CY2016. However, the rate of NAS births has decreased for two

¹ Definition: Drug withdrawal syndrome in a newborn, excluding fetal alcohol syndrome.

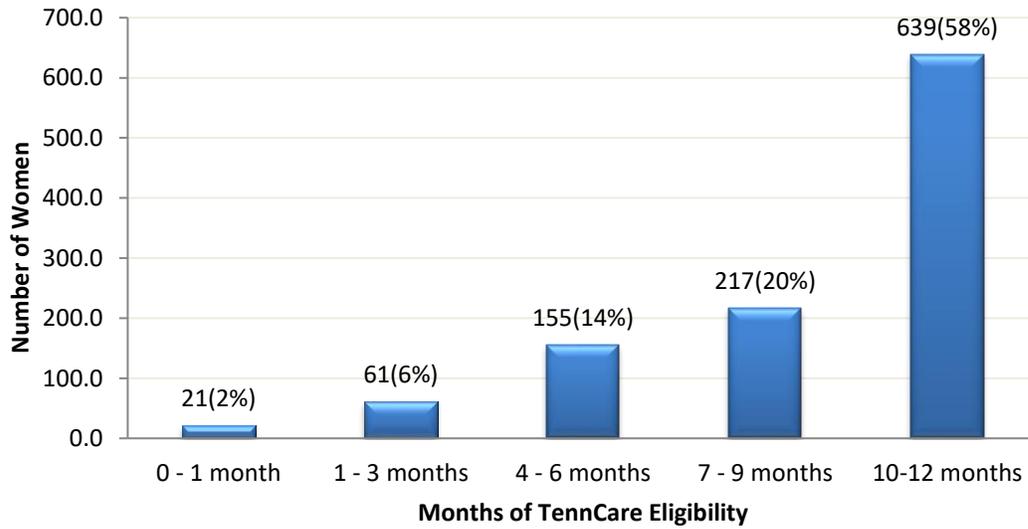
successive years. The number of TennCare births changed significantly from CY2016 to CY2018 with a 2.2% decrease in births, yet over the same time period, there has been a 13% decrease in NAS cases.

Figure 2: 2018 NAS Mother’s TennCare Status at Time of Delivery

Calendar Year	TennCare Newborns Treated for NAS During Year	Mothers on TennCare at Time of TennCare NAS Birth	Percent of TennCare NAS Infants Born to TennCare Mothers	Mothers NOT on TennCare at Time of TennCare NAS Birth	Percent of TennCare NAS Infants NOT Born to TennCare Mothers
2008	264	229	87%	35	13%
2009	444	335	75%	109	25%
2010	512	424	83%	88	17%
2011	528	483	91%	45	9%
2012	736	613	83%	123	17%
2013	943	823	87%	120	13%
2014	1,101	1,017	92%	84	8%
2015	1,197	1,098	92%	99	8%
2016	1,357	1,261	93%	96	7%
2017	1,363	1,254	92%	109	8%
2018	1,181	1,093	93%	88	7%

Figure 2 presents information regarding the TennCare status of mothers of TennCare NAS infants at the time of birth. In 2018, 93% of TennCare NAS infants were born to mothers who had TennCare coverage at the time of delivery, while the remaining 7% of NAS infants were born to mothers who were not TennCare-eligible at the time of delivery.

Figure 3: Length of Prior Year’s Eligibility for 2018 TennCare NAS Mothers



For each woman with a TennCare child diagnosed with NAS in CY2018, the length of eligibility coverage for the mother prior to the child’s birth was determined (Figure 3). The large majority (78%) of women with NAS children had TennCare coverage for 7 months or more prior to the child’s delivery.

Figure 5: Demographic Characteristics of 2018 NAS Mothers

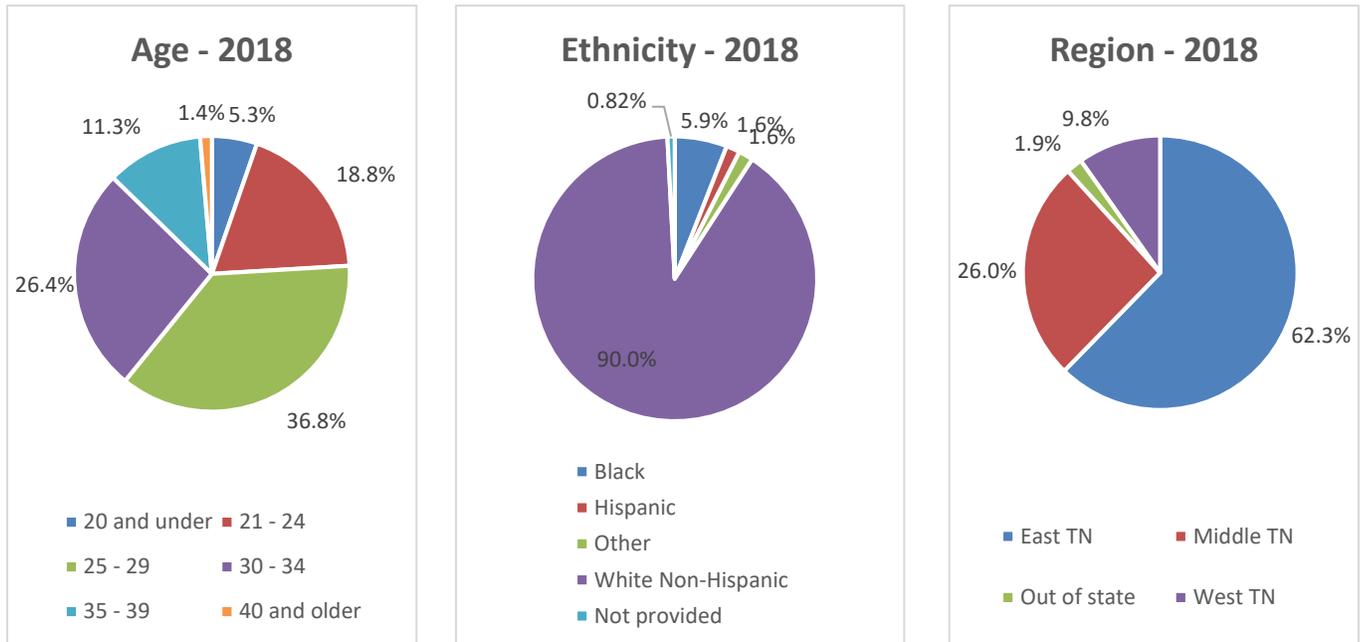


Figure 5 displays basic demographic characteristics of NAS mothers who had TennCare eligibility coverage for any period of time in the year prior to the CY 2018 birth of a NAS infant. Approximately 82% of the NAS mothers were between the ages of 21 and 34, a decrease from the previous year (85%). About 62% of NAS mothers had a county of residence in East Tennessee. Ninety percent of NAS mothers covered by TennCare were White Non-Hispanic, a number that is consistent with previous years.

Figure 6: Impact of NAS on infant health care expenditures² - 2018 data

Metric	All TennCare paid live births	All TennCare normal birth weight births	All TennCare live low birth weight births	NAS Infants
Number of births	46,423	41,308	5,115	1,170
Total costs for infants in first year of life	\$426,525,051	\$206,445,547	\$220,079,504	\$50,084,236
Average cost per child	\$9,188	\$4,998	\$43,026	\$42,807
Average length of stay (days)	4.1	2.4	18.2	21.8

To determine the financial impact of NAS relative to all births, TennCare’s Interchange System (surp1 database) was used to quantify expenditures for live born infants in the first year of life (Figure 6). In CY2018, the average cost of care for a NAS infant in the first year of life is more than 8 times higher than the average cost of care for normal birth weight infants and nearly equal to the average cost of care for low birth weight infants.

Figure 7: Percentage of infants in DCS custody within one year of birth - 2018 data

Metric	All Infants	NAS Infants
Total Number of Infants	51,084	1,181
Number of Infants in DCS Custody	821	205
Percent of Infants in DCS Custody	1.6%	17.4%

Using TennCare eligibility records, it was determined that 205 of the 1,181 infants diagnosed with NAS in CY2018 (17.4%) were placed in Department of Children’s Services (DCS) custody within one year of their birth. Among all TennCare infants born in CY2018, 1.6% were placed in DCS custody within one year of birth (Figure 7). Infants born with NAS are about 10.8 times more likely to be in DCS custody during their first year of life as compared to other TennCare infants.

² Includes all expenditures paid through the first year of life. Totals are subject to change based on updated data.

Figure 8: Number and Percentage of Opioid Prescriptions Among NAS Mothers Paid by TennCare 2018

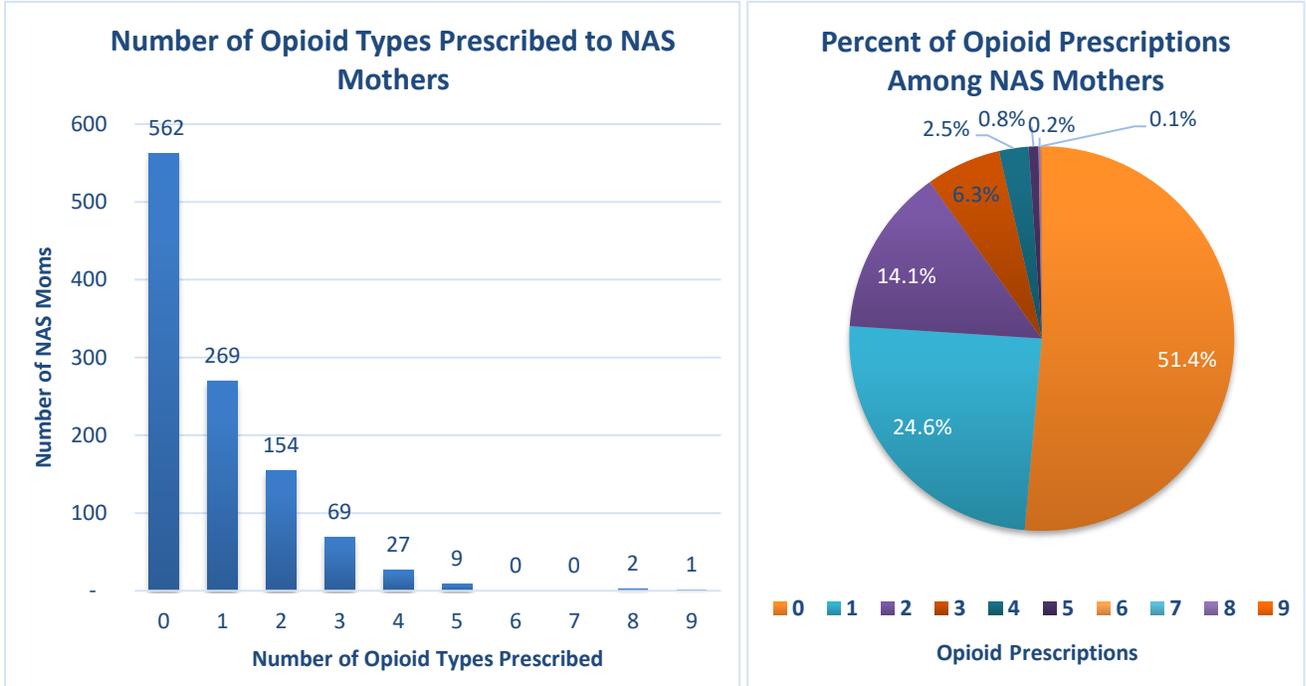
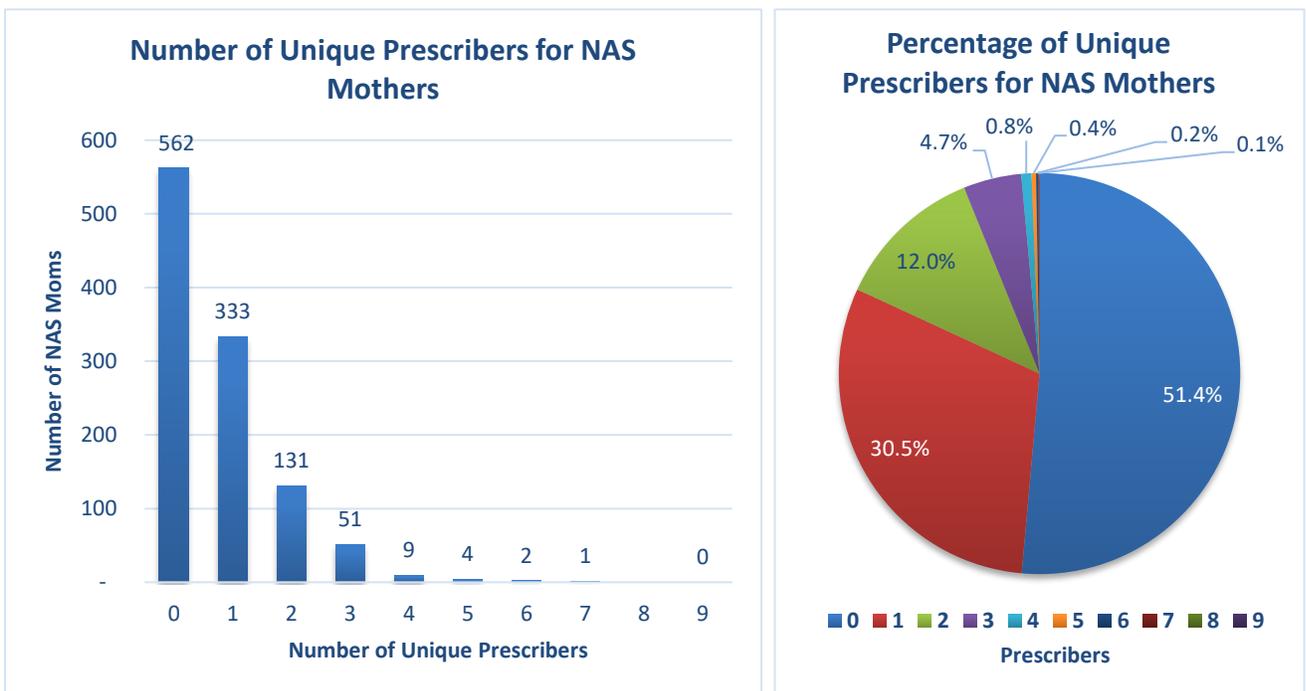


Figure 9: Number and Percentage of Unique Prescribers for NAS Mothers



All opioid claims up to one year prior to birth for any woman with a NAS child were evaluated. Figures 8 and 9³ illustrate the numbers of NAS mothers with TennCare-paid prescriptions for varying numbers of opioid drugs as well as the number of unique prescribers. Overall, a total of 3,889 TennCare-paid prescriptions for opioids were issued to women with NAS babies. This represents nearly a 17.6% decrease in the total number of TennCare-paid opioid prescriptions compared to the previous year (n=4,718). The overall percentage of mothers who received zero opioid prescriptions paid by TennCare is 51.4% (562/1,093) for CY2018 versus 49.8% (642/1,280) for CY2017. Among NAS mothers with at least one opioid prescription paid by TennCare, each mother had on average 7.3 opioid prescriptions and 1.6 unique prescribers of opioids in the year period. Approximately 37% of women with NAS babies who received opioid prescriptions appeared to be receiving treatment for opioid dependence/addiction⁴; however, it is important to note that at the TennCare did not cover methadone clinic services during the time frame covered by this report. Therefore, if these women were receiving methadone maintenance therapy, claims for those services would not be included in this count. Additionally, this does not account for services provided in an institutional setting, such as an inpatient hospital, or other forms of addiction treatment where a separate pharmacy claim does not exist. These results show continued improvement in reducing opioid utilization and improving access to opioid use disorder treatment.

³ Any pharmacy claim with an National Drug Code correlation to the following Therapeutic Class Codes (HIC3) was considered an opioid: H3A, H3H, H3J, H3M, H3N, H3R, H3T, H3U, H3W or H3X.

⁴ Based on prescriptions for drugs in therapeutic classes H3T and H3W, including buprenorphine and naltrexone.

Figure 10: Narcotic Analgesic and Contraceptive Use Among All TennCare Women - 2018 Data

Demographics (Years)	TennCare Women	Women Prescribed Opioid (>30 days supplied)	Opioid Users Rate per 1,000	Women Prescribed Contraceptives and Opioid	% of Women on Opioid and Contraceptives	Women Prescribed Opioid without Contraceptives	% of Women on Opioid without Contraceptives
All Women 15 - 44	356,737	13,711	38	1,836	13%	11,875	87%
15 - 20	90,259	124	1	49	40%	75	60%
21 - 24	44,490	531	12	139	26%	392	74%
25 - 29	67,965	1,847	27	430	23%	1,417	77%
30 - 34	61,372	2,884	47	500	17%	2,384	83%
35 - 39	54,352	4,114	76	440	11%	3,674	89%
40 - 44	38,298	4,211	110	278	7%	3,933	93%

Note: Voluntary Reversible Long Acting Contraceptives (VRLAC) was not included in the table above; future reports anticipated to include members receiving forms of long – acting contraceptives in the numerator for this metric. This metric also does not account for permanent forms of contraception such as tubal ligation or hysterectomy.

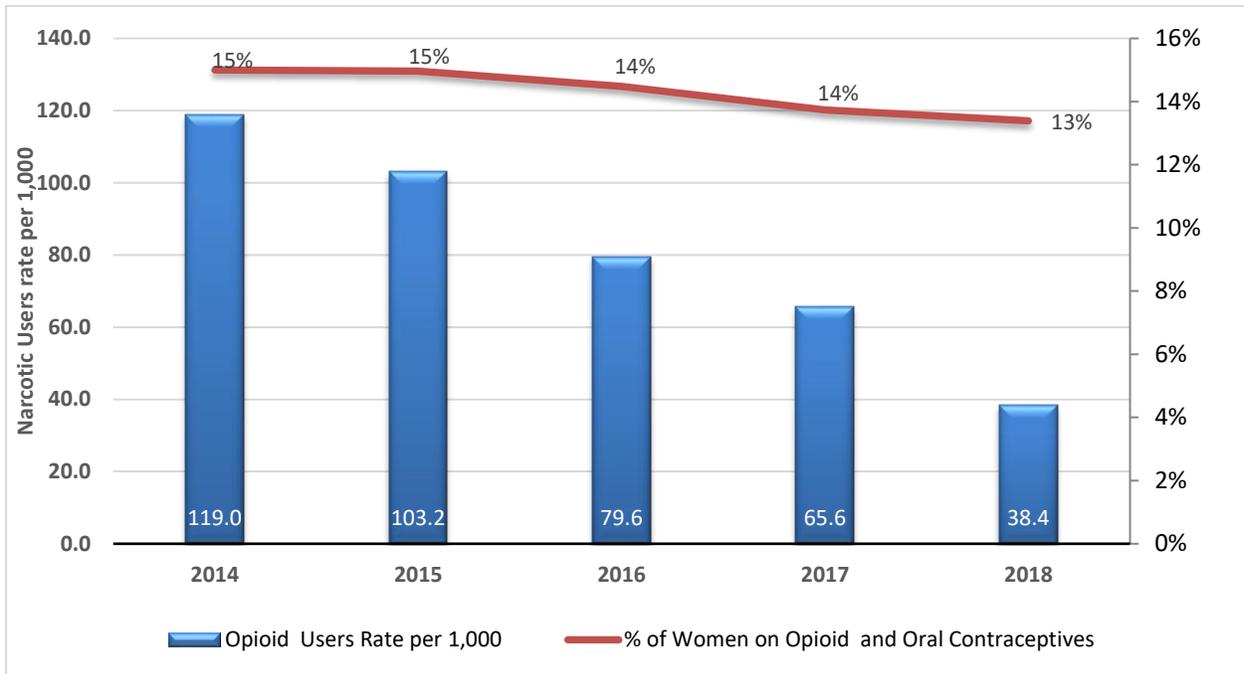
The rate of women using prescribed opioid and contraceptive medications was determined in CY2018 (Figure 10). The analysis was limited only to women of child-bearing age (15–44). The prescription histories of TennCare women of child-bearing age were evaluated for the presence of opioid and contraceptive products⁵. Women were excluded from the analysis if they had opioid prescriptions totaling less than 30 days in CY2018.

As Figure 10 indicates, approximately 13% of women of child-bearing age who were prescribed opioids are also prescribed some form of contraceptive. The overall rate of prescription opioid utilization among women aged 15-44 is 38 opioid users per 1,000 eligible women, a 41% decrease compared to the previous year (see Figure 11 below). The data above indicates that approximately 11,875 women of child-bearing age who are using opioids for more than 30 days a year were not on a contraceptive paid for by TennCare. This analysis captured contraceptive use (e.g. oral and voluntary long-acting reversible contraceptives) though clinical utilization of additional other contraceptive options has been used increasingly. Future analysis will attempt to incorporate these additional forms of contraception (e.g. birth control injections,

⁵ Any pharmacy claims with an NDC correlating to any HIC3 codes of G8A, G8B, G8C, G8F, G9B, X1C, G9A was considered a contraceptive.

or TennCare members who have had sterilization procedures) to better analyze contraceptive usage amongst TennCare narcotic users.

Figure 11: Narcotics and Contraceptives Trends for TennCare women – 2018 data



Based on the 5-year data regarding the utilization of opioid and oral contraceptives among TennCare women aged 15 to 44 years old, the rate of opioid users per 1,000 women continuously decreased during 2014-2018. Figure 11 shows 68% decrease in the rate of opioid use among women aged 15-44 from 2014 to 2018 (119.0 versus 38.4 per 1,000 women). The concurrent prescription of contraceptives with an opioid prescription had a slight decrease from 2017 to 2018 also. As discussed, this decrease may suggest that alternative forms of birth control are being used and will be an area for potential future analyses in subsequent NAS reports.